List of Tables

Table 1.1 Ground water contamination due to nitrate reported from India 7
Table 1.2 Denitrifying bacteria used for nitrate and nitrogen removal process..... 9
Table 1.3 Use of consortia in the treatment of various wastewaters 10
Table 1.4 Bioreactors used for denitrification process 14
Table 1.5 Application of MBBR for the treatment of different wastewaters 16
Table 1.6 Techniques used to observe biofilm inside MBBR 25
Table 1.7 NGS analysis in denitrifying bioreactors..... 26
Table 1.8 *Thauera* species and their role in biodegradation..... 27
Table 1.9 Recent reports of *Thauera* dominated denitrification reactors 28
Table 2.1 16S rRNA gene specific primer sequences of individual isolates of consortium DC5 used for PCR analysis..... 40
Table 2.2 Enumeration of denitrifying bacteria in Winogradsky column (MPN index) 45
Table 2.3 Morphological and microscopic characteristics of the amyloid produ- cing denitrifying isolates from Winogradsky columns..... 47
Table 2.4 Results of antibiotic sensitivity test for consortium DC5 isolates 54
Table 2.5 Relative rates of selected five isolates of consortium DC5 for nitrate removal 65
Table 2.6 Growth of individual members of consortium DC5 in MM2 medium supplemented with different carbon sources in terms 16S rRNA gene amplification by semi-quantitative PCR analysis 71
Table 2.7 Optimized parameters affecting biofilm forming ability and denitrification efficiency of Consortium DC5..... 72
Table 3.1 Composition of reagents for Folin Lowry method 79
Table 3.2 EPS components analysis of biofilm developed on different carrier types 86
Table 3.3 EPS components analysis 93
Table 3.4 Comparative studies between suspended growth reactor, MBBR inoculated with activated sludge and control MBBR (i.e. without inoculum)..... 95
Table 3.5 Industrial effluents characteristics 95
Table 3.6 EPS components analysis 99

Table 3.7 Treatment of different industrial effluents with consortium DC5 in dMBBR . 99
Table 4.1 Relative abundance of genes involved in nitrogen metabolism 115
Table 4.2 Relative abundance of genes involved in sulfur metabolism pathway..... 118
Table 4.3 Relative abundance of genes involved in methane metabolism 121
Table 4.4 Relative abundance of xenobiotic degradation pathways present in biofilm . 124